

REMARKS

A. SUMMARY OF THE AMENDMENTS

The present application contains 45 claims numbered 2 to 46.

Claim 1 has been cancelled and its limitations have been incorporated into claim 3.

Claims 2, 5 and 36 have had their dependencies changed.

No new subject matter has been added by way of the present amendment.

B. REJECTION OF CLAIMS 1-6, 28-37 AND 42-45 UNDER 35 U.S.C. 102

On page 2 of the Office Action, the Examiner has rejected claims 1-6, 28-37 and 42-45 under 35 U.S.C. 102(a) as being anticipated by McCrosky *et al.* U.S. Patent 6,741,552 (hereinafter referred to as McCrosky). In view of the cancellation of claim 1, the Examiner's argument is moot in respect of this claim. As for claims 2-6, 28-37 and 42-45, the Applicant respectfully traverses this rejection and submits that claims 2-6, 28-37 and 42-45 are in allowable form, as set forth herein below.

Claim 3

The present invention is directed to a switch fabric architecture on a chip, where each element of the array (i.e., each "cell") is connected to each of the other elements of the array, and where each element of the array includes a corresponding number of receivers to handle communication from these various other elements of the array. Specifically, the Examiner's attention is directed to the following excerpt of claim 3 (emphasis added):

"a transmitter in communication with said I/O interface and in communication with every other cell of said array [...];
for each said other cell of said array, a respective receiver associated with said other cell, the respective receiver being in communication with said other cell allowing said other cell to forward data packets to the respective receiver;"

McCrosky, on the other hand, is directed to a cell switching architecture based on a network of switching elements connected in the manner of a "hypercube" to form a switch fabric. According to McCrosky, col. 7, lines 62-65, "The invention presented uses a short, fixed length header attached to each cell to provide (among other things) routing information to guide the cell from its source switching element to its destination switching element". As per col. 8, lines 10-11 of McCrosky: "A routing code (RC) is calculated to guide a cell in its hop-by-hop path from source to destination".

In short, McCrosky's packets (confusingly referred to as "cells") generally do not travel from source to destination in a hopless fashion, i.e., directly from source to destination; rather, they tend to undergo a number of intermediate hops. This is intrinsic to the hypercube structure contemplated by McCrosky, and is in contrast to the structure of the claimed invention whereby at a given cell in the switch fabric, there is provided a set of receivers, one for each of the other cells in the switch fabric, which allows direct source-to-destination travel with no intermediate hops.

Since claim 3 recites at least one feature that is not taught or suggested in the cited reference, it is respectfully submitted that a rejection under 35 U.S.C. 102 is improper. Therefore, the Examiner is respectfully requested to withdraw the rejection of claim 3.

Claims 2, 4-6, 28-37 and 42-45

These claims are all either directly or indirectly dependent on claim 3 and therefore include all the limitations of claim 3, including those already shown to be absent from McCrosky. Thus, for the same reasons as those set forth

above in support of claim 3, the Examiner is requested to withdraw the rejection of claims 2, 4-6, 28-37 and 42-45.

C. REJECTION OF CLAIMS 7-11 UNDER 35 U.S.C. 103

On page 7 of the Office Action, the Examiner has rejected claims 7-11 under 35 U.S.C. 103(a) as being unpatentable over McCrosky *et al.* U.S. Patent 6,741,552 (hereinafter referred to as McCrosky) in view of Boggess *et al.* U.S. Patent 6,674,971 (hereinafter referred to as Boggess). The applicant respectfully traverses this rejection and submits that claims 7-11 are in allowable form, as set forth herein below.

Firstly, claims 7-11 are all either directly or indirectly dependent on claim 3 and therefore include all the limitations of claim 3, including those already shown to be absent from McCrosky. Specifically, McCrosky fails to teach or suggest:

“a transmitter in communication with said I/O interface and in communication with every other cell of said array [...];
for each said other cell of said array, a respective receiver associated with said other cell, the respective receiver being in communication with said other cell allowing said other cell to forward data packets to the respective receiver;”

Moreover, it is respectfully submitted that the above limitations are also absent from Boggess, which is directed to an optical communication network with receiver-reserved channels. Specifically, transmission on any particular receiver-reserved channel results in data being sent to a predetermined node having that particular receiver-reserved channel. When the data passes through nodes other than the predetermined node, it is passed by those other nodes without pausing to check the address information in the header (see Abstract of Boggess).

Looking more closely at Boggess (see Fig. 7B, for example), for a given node (say node 350), only one receiver (the top one) is susceptible of receiving data destined for node 350 along the receiver-reserved channel for that node

(channel 316). Thus, it would be false to contend that for each of the *other nodes*, node 350 includes a *respective receiver associated with that other node*.

Moreover, the origin of the data received along channel 316 is variable, i.e., it may have been placed onto channel 316 (or 314 or 312 or 310) by any of the other nodes. Thus, for the one receiver that truly does carry data to node 350, it cannot be said that this receiver is associated with *any* of the other nodes 360, 370, 380.

Furthermore, it is respectfully submitted that a person skilled in the art would not be motivated to combine the teachings of Boggess with those of McCrosky. This is at least partly because McCrosky's hypercube structure necessitates a routing code (RC) to guide a cell in its hop-by-hop path from source to destination (McCrosky, col. 8, lines 10-11), whereas in Boggess, the intent is to avoid destination addressing by using dedicated channels (see Boggess generally).

In view of the foregoing, it is clear that there is at least one limitation of claims 7-11, which is not taught or suggested in the cited art. Also, there is no motivation to combine the cited references. It follows that at least two of the criteria required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j)¹ have not been satisfied. The Examiner is therefore respectfully requested to withdraw the rejection of claims 7-11, which are believed to be in condition for allowance.

D. REJECTION OF CLAIMS 12-15 UNDER 35 U.S.C. 103

On page 9 of the Office Action, the Examiner has rejected claims 12-15 under 35 U.S.C. 103(a) as being unpatentable over McCrosky *et al.* U.S. Patent

¹ For the Examiner to establish a *prima facie* case of obviousness, three criteria must be considered: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings, (2) there must be a reasonable

6,741,552 (hereinafter referred to as McCrosky) in view of Boggess *et al.* U.S. Patent 6,674,971 (hereinafter referred to as Boggess) in further view of "Norton".

Regrettably, the Applicant does not know what "Norton" refers to. There is no reference to "Norton" in either the Information Disclosure Statements filed with the USPTO or in the Notice of References Cited that was issued by the Examiner. The Examiner is therefore respectfully requested to withdraw the rejection or to identify with greater precision the reference that the Examiner has cited.

Nevertheless, the Applicant wishes to indicate that claims 12-15 are all dependent either directly or indirectly on claim 3, and therefore if claim 3 is found to be allowable pursuant to the amendments and arguments presented herein, then the Examiner is respectfully requested to carefully reconsider whether reissuing the current rejection by specifying "Norton" would be warranted.

E. REJECTION OF CLAIMS 16-17 UNDER 35 U.S.C. 103

On page 10 of the Office Action, the Examiner has rejected claims 16-17 under 35 U.S.C. 103(a) as being unpatentable over McCrosky *et al.* U.S. Patent 6,741,552 (hereinafter referred to as McCrosky) in view of Boggess *et al.* U.S. Patent 6,674,971 (hereinafter referred to as Boggess) in further view of Black *et al.* U.S. Patent 6,614,796 (hereinafter referred to as Black). The applicant respectfully traverses this rejection and submits that claims 16-17 are in allowable form, as set forth herein below.

Firstly, claims 16-17 are both either directly or indirectly dependent on claim 3 and therefore include all the limitations of claim 3, including those already shown to be absent from McCrosky and Boggess. Specifically, McCrosky and Boggess, whether taken severally or in combination, fail to teach or suggest:

expectation of success, and (3) the prior art references must teach or suggest all of the claim

"a transmitter in communication with said I/O interface and in communication with every other cell of said array [...];
for each said other cell of said array, a respective receiver associated with said other cell, the respective receiver being in communication with said other cell allowing said other cell to forward data packets to the respective receiver;"

Moreover, it is respectfully submitted that the above limitations are also absent from Black, which is directed to an arbitrated loop bufferless switch. Specifically, in col. 10, line 34 through column 11, line 6 (which includes the passage cited by the Examiner), Black discloses relaying control information from a receiving node through a third node to use that third node's underutilized data channel towards a transmitting node. This approach avoids requiring a dedicated back channel from the receiving node towards the transmitting node, and hence is contrary to claims 3 (and hence claims 16 and 17), whereby for a given cell in the switch fabric, there is provided a set of receivers, one dedicated to each of the other cells in the switch fabric.

In view of the foregoing, it is clear that there is at least one limitation of claims 16-17, which is not taught or suggested in the cited art. It follows that there is at least one criterion required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j), which has not been satisfied. The Examiner is therefore respectfully requested to withdraw the rejection of claims 16-17, which are believed to be in condition for allowance.

F. REJECTION OF CLAIMS 18-27 AND 46 UNDER 35 U.S.C. 103

On page 11 of the Office Action, the Examiner has rejected claims 18-27 and 46 under 35 U.S.C. 103(a) as being unpatentable over McCrosky *et al.* U.S. Patent 6,741,552 (hereinafter referred to as McCrosky) in view of Boggess *et al.* U.S. Patent 6,674,971 (hereinafter referred to as Boggess) and Black *et al.* U.S. Patent 6,614,796 (hereinafter referred to as Black), in further view of Corbalis *et al.* U.S. Patent 5,430,715. The applicant respectfully traverses this

limitations. MPEP §§ 706.02(j), 2142 (8th ed.).

rejection and submits that claims 18-27 and 46 are in allowable form, as set forth herein below.

Firstly, claims 18-27 and 46 are all either directly or indirectly dependent on claim 3 and therefore include all the limitations of claim 3, including those already shown to be absent from McCrosky and Boggess and Black. Specifically, McCrosky and Boggess and Black, whether taken severally or in combination, fail to teach or suggest:

"a transmitter in communication with said I/O interface and in communication with every other cell of said array [...];
for each said other cell of said array, a respective receiver associated with said other cell, the respective receiver being in communication with said other cell allowing said other cell to forward data packets to the respective receiver;"

Moreover, it is respectfully submitted that the above limitations are also absent from Corbalis, which is directed to a mechanism for routing a communication cell in a cell switching communication controller. Specifically, reference is made to col. 4, lines 57-63 of Corbalis (emphasis added): "The communication modules 50-53 exchange communication cells by transferring cell frames over a set of cell exchange lines 62. The cell exchange lines 62 comprise multiple pairs of transmit and receive data lines. The cell exchange lines 62 provide a pair of transmit and receive data lines for each of the communication modules 50-53." This is in stark contrast to the claimed invention, whereby a given cell of an array includes as many receivers as there are **other cells** in the array.

In view of the foregoing, it is clear that there is at least one limitation of claims 18-27 and 46, which is not taught or suggested in the cited art. It follows that there is at least one criterion required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j), which has not been satisfied. The Examiner is therefore respectfully requested to withdraw the rejection of claims 18-27 and 46, which are believed to be in condition for allowance.

G. REJECTION OF CLAIMS 38-39 UNDER 35 U.S.C. 103

On page 14 of the Office Action, the Examiner has rejected claims 38 and 39 under 35 U.S.C. 103(a) as being unpatentable over McCrosky *et al.* U.S. Patent 6,741,552 (hereinafter referred to as McCrosky) in view of Kappler *et al.* U.S. Patent 6,064,677. The applicant respectfully traverses this rejection and submits that claims 38-39 are in allowable form, as set forth herein below.

Firstly, claims 38-39 are both either directly or indirectly dependent on claim 3 and therefore include all the limitations of claim 3, including those already shown to be absent from McCrosky. Specifically, McCrosky fails to teach or suggest:

"a transmitter in communication with said I/O interface and in communication with every other cell of said array [...];
for each said other cell of said array, a respective receiver associated with said other cell, the respective receiver being in communication with said other cell allowing said other cell to forward data packets to the respective receiver;"

Moreover, it is respectfully submitted that the above limitations are also absent from Kappler, which is merely directed to multiple rate sensitive priority queues. In fact, Kappler's discussion of switch fabrics is cursory at best, and does not provide detail regarding the switch fabric 24 in terms of its constituent cells. A complete review of Kappler reveals a failure to reach a level of detail that would teach or suggest the above-identified limitations that are missing from McCrosky.

In view of the foregoing, it is clear that there is at least one limitation of claims 38-39, which is not taught or suggested in the cited art. It follows that there is at least one criterion required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j), which has not been satisfied. The Examiner is therefore respectfully requested to withdraw the rejection of claims 38-39, which are believed to be in condition for allowance.

H. REJECTION OF CLAIMS 40-41 UNDER 35 U.S.C. 103

On page 15 of the Office Action, the Examiner has rejected claims 40-41 under 35 U.S.C. 103(a) as being unpatentable over McCrosky *et al.*. The applicant respectfully traverses this rejection and submits that claims 40-41 are in allowable form, as set forth herein below.

Firstly, claims 40-41 are both either directly or indirectly dependent on claim 3 and therefore include all the limitations of claim 3, including those already shown to be neither taught nor suggested by McCrosky. Specifically, McCrosky was found to lack any teaching or suggestion of:

"a transmitter in communication with said I/O interface and in communication with every other cell of said array [...];
for each said other cell of said array, a respective receiver associated with said other cell, the respective receiver being in communication with said other cell allowing said other cell to forward data packets to the respective receiver;"

On this basis alone (i.e., at least one limitation of claims 40-41 that is not taught or suggested in the cited art), the Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness in accordance with MPEP 706.02(j). The Examiner is therefore respectfully requested to withdraw the rejection of claims 40-41, which are believed to be in condition for allowance.

In addition, and notwithstanding the above, the Applicant respectfully traverses the argument presented by the Examiner in rejecting claims 40 and 41. Specifically, the Applicant considers it noteworthy to bring to light certain ones of the Examiner's arguments on pages 15 and 16 of the Office Action mailed November 19, 2004 (emphasis added):

"An ATM cell is divided up into a header and payload (one may think of these as words) of a fixed length; the system knows how far whichever portion of the cell it is currently forwarding is from the end of the packet because of the fixed length of the cells. It would have been obvious to one skilled in the art at the time of the invention to have an indicator of how far from the end of the packet a particular portion of the packet is.

The motivation would be to know how much time until the next packet should be transmitted."

"An ATM cell is divided up into a header and payload (one may think of these as words) of a fixed length; the system knows how far whichever portion of the cell it is currently forwarding is from the end of the packet because of the fixed length of the cells. It would have been obvious to one skilled in the art at the time of the invention to start forwarding the next packet when a particular point in the previous packet has been reached. ***The motivation would be to promptly forward all packets as soon as the previous packet is done.***"

With all due respect, the above passages illustrate an inappropriate use of hindsight in rejecting the claims under 35 U.S.C. 103. While someone reading the patent application may agree that it is useful to "know how much time until the next packet should be transmitted" or to "promptly forward all packets as soon as the previous packet is done", the Applicant respectfully submits that the Examiner should not presuppose that such motivation existed at the date of invention. In other words, the Applicant considers it inappropriate for the Examiner to fabricate a motivation after having the benefit of reading the claims, and then to use that fabricated motivation as an argument of obviousness against those very same claims!

It should be noted that the use of hindsight in this fashion to reject claims as being obvious has been strictly denounced in the case law (see, *inter alia*, *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983));

"To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher."

In view of the foregoing, it is apparent that the Examiner has additionally failed to satisfy a second one of the criteria required for establishing a *prima facie* case of obviousness in accordance with MPEP 706.02(j). The Examiner is therefore respectfully requested to withdraw the rejection of claims 40-41, which are believed to be in condition for allowance.

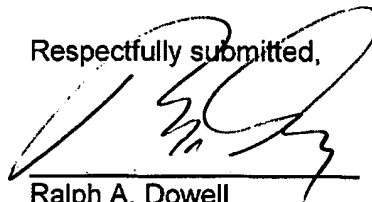
CONCLUSION

In view of the foregoing, Applicant believes that claims 2-46 are in allowable form. Favourable reconsideration is requested. Early allowance of the Application is earnestly solicited.

If the application is not considered to be in full condition for allowance, for any reason, the Applicant respectfully requests the constructive assistance and suggestions of the Examiner in drafting one or more acceptable claims pursuant to MPEP 707.07(j) or in making constructive suggestions pursuant to MPEP 706.03 so that the application can be placed in allowable condition as soon as possible and without the need for further proceedings.

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Respectfully submitted,



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